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### DE PLANTIS TOXICARIIS E MUNDO NOVO TROPICALE COMMENTATIONES V

*Virola* as an orally administered hallucinogen

BY

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IN 1954, the source of a new hallucinogenic snuff from the northwest Amazon was identified as the resin of several species of the myristicaceous genus *Virola* (17). The species employed amongst Indians of the Amazonian region of Colombia were *Virola calophylla* Warburg, *V. calophylloidea* Markgraf and probably also *V. elongata* (Benth.) Warburg.

Additional but often rather vague reports seemed to indicate that this same kind of snuff was prepared and utilized in the headwaters of the Orinoco in Venezuela (15, 27, 29) and to the north of the Rio Negro of Brazil (4, 8, 9, 14, 27). Eventually, specimens and photographs documented the use of *Virola*-bark for this purpose in that part of Brazil (24). Finally, in 1968, a detailed ethnotoxicological study of these myristicaceous snuffs (23) showed that the species employed, apparently to the exclusion of others, by diverse groups of Waiká Indians of northern tributaries of the Rio Negro in Brazil is *Virola theiodora* (Spr. ex Benth.) Warburg.

In the absence of phytochemical analysis of the snuff or of the resin from which it was made, the identity of the active principle of *Virola calophylla* and *V. calo-*

*phylloidea* was not known, and the suggestion that the psychoactive properties of the snuff might be attributable to myristicine or some component of it was offered (17). Recent investigation of *Virola theiodora*, however, has shown that the resin is rich in tryptamines (2). The *nyakwana* snuff of the Waikás, prepared from resin of *Virola theiodora* with no admixture, contains approximately 8% of 5-methoxy N, N-dimethyltryptamine, N, N-dimethyltryptamine and traces of other tryptamines (2).

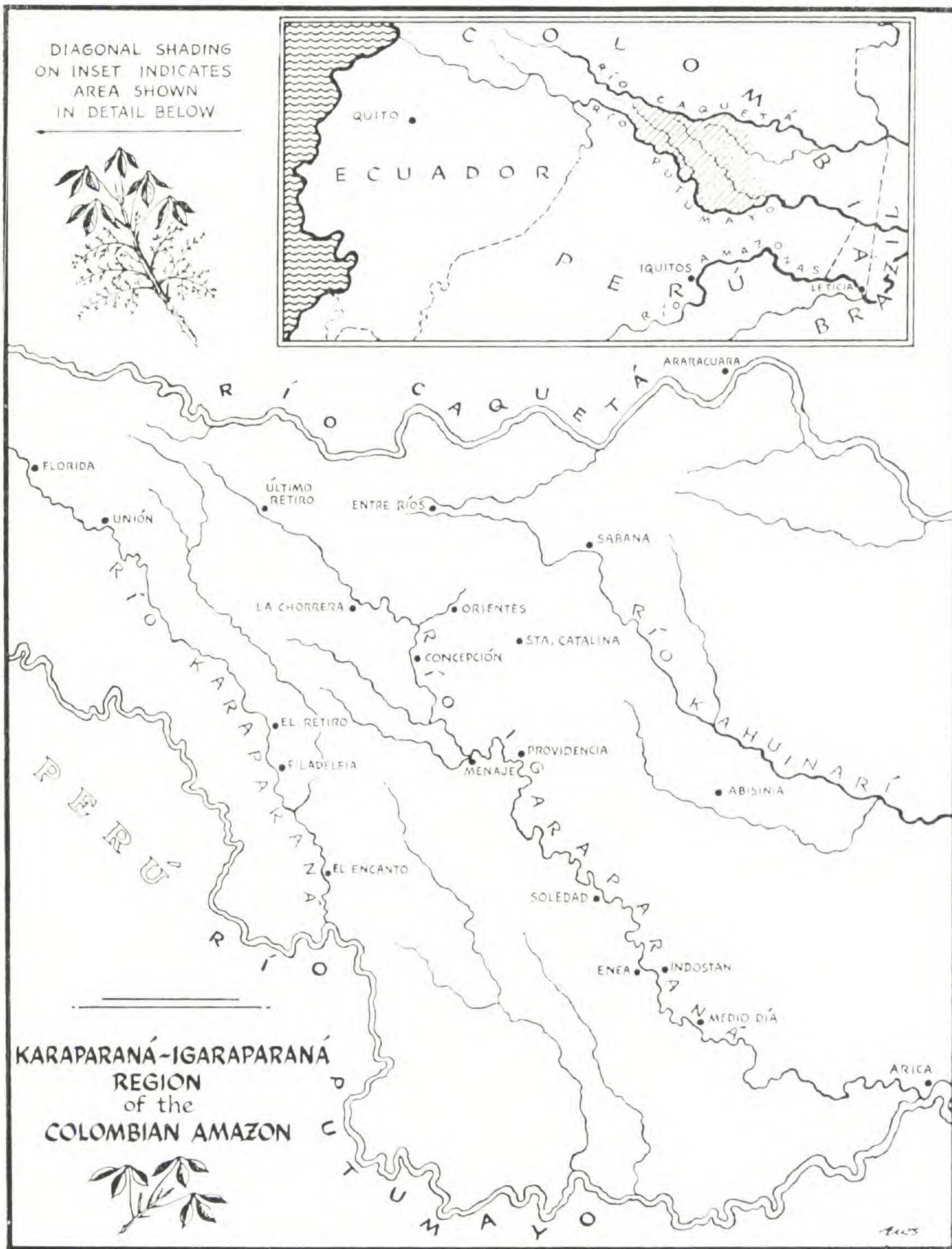
Because of similarity of the psychoactivity of the snuff prepared from *Virola theiodora* and that from *V. calophylla* and *V. calophylloidea*, there is now every reason to presume that the latter two species owe their effects to the same or similar tryptamines as those found in the former. These compounds have also been indicated in an analysis of the bark of *Virola calophylla* (13).

As a result of recent chemical studies, *Virola* must now be added to the list of South American hallucinogens the effects of which are due to tryptamines. These tryptaminic narcotics include *Anadenanthera peregrina* and other species of this leguminous genus; *Mimosa hostilis*; *Banisteriopsis Rusbyana*; *Psychotria psychotriacifolia*; and possibly *Justicia pectoralis* var. *stenophylla*.

Recent field work in the vicinity of Leticia, Colombia, on the Amazon River, has uncovered an interesting new method of employing myristicaceous resin orally as a psychotomimetic agent.

In February, 1969, I was engaged in collecting for phytochemical study several species of *Virola* along the Río Loretoyacu near Leticia. One of my native assistants was a Witoto Indian—Luis Vargas Martínez—who had lived in this region for more than 25 years and with whom I had worked over a number of years. He is a native of El Encanto on the Río Karaparaná, an affluent of the

PLATE LXII



Area of the Colombian Amazon inhabited by the Witoto Indians.

Río Putumayo, which, with its parallel river, the Igaraparaná, comprises the major centre of the Witoto Indians (5, 12, 20, 25, 26). As a result of the nefarious and merciless exploitations and slaughter of these Indians during the wild rubber boom, this region attracted, at least fleetingly, world-wide attention in the early part of the present century. The past 40 years, with missionary contacts, have seen a gradual acculturation of the Witotos, and many of their beliefs and customs have been altered or have disappeared. This acculturation may possibly explain our delay in discovering such an interesting and unique method of preparing and utilizing *Virola*-resin as an hallucinogen.

During the collecting of the bark from several species of *Virola*, this Witoto assistant informed me that the Witotos of his father's generation ate pellets made of *cumala* resin when they wanted to "see and converse with the little people". *Cumala*, a Peruvian name for several species of *Virola*, is employed in the Trapecio Amazónico—the Leticia area. The assistant informed me that the species of *Virola* which his people employed did not exist or was very rare in the Río Loretoyacu area, but he did describe it as a medium-sized tree, slender, growing well above the flood-lands on *tierra alta*. The leaf, according to the informant, is "dry" to the appearance, measuring about six inches in length, with undulating margins. The bark, from which copious red resin exudes, is thin, light brown. The Witoto name of the tree in the Río Karaparaná is *oo-koó-na*.

While it was impossible for us to collect a voucher specimen in the Río Loretoyacu, I believe that the species represents *Virola theiodora*. In 1942, amongst the Witotos of the Río Karaparaná region, I collected (*R. E. Schultes 3878*<sup>1</sup>) *Virola theiodora* with the annotation that

<sup>1</sup> Comisaría del Amazonas, Río Karaparaná, along path from El En-

it was "intoxicating". I could get no further information at that time. The Witoto name of this plant in the Río Karaparaná was *oo-koó-na*, the same name given to me by the informant, but this Indian name may refer generically to more than one species of *Virola* or even to species in related genera. A collection (*R. T. Martin et C. A. Lau-Cam 1272*) of *Dybalanthera parviflora* from the Río Napo in adjacent Peru, for example, bears the Witoto name *u-kú-na*.

The Witotos rasp the inner part of the freshly stripped bark, roll the rasped tissue into balls and express the resin from it into a pot of water which is boiled for five or six hours, until the mass becomes a thick syrup that sticks to the wooden paddle that has been used to stir the boiling mixture.

While this operation is progressing with the resin of *Virola*, another Indian reduces to ashes the bark of a "large tree with long leaves, like *matamatá*" that grows in floodland. We were fortunate in being able to collect flowering material of this tree in the Río Loretoyacu region: it represents *Gustavia Poeppigiana* Berg ex Martius.<sup>2</sup> The Witoto name of this tree is *hě-rog*.

The ashes are placed in a funnel made of strong leaves, and cool water is poured over the ashes and allowed to seep through until "no more cloudiness leaches out". The water is then slowly boiled down until a greyish residue or "salt" is left. This is known in Witoto as *lẽ-sa*.

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canto to La Chorrera. "Small tree. Height 40 ft. Red resin in bark. Intoxicating. Witoto: *oo-koó-na*". May 31-June 2, 1942. *R. E. Schultes 3878*.

<sup>2</sup>Comisaría del Amazonas, Río Loretoyacu, 3 km. above Puerto Nariño. In lowland forest. "Tree 7 m. tall. Leaves dark green, shiny. Petals white, stamens yellow. Fruit green, seeds germinating within ripe fruit." January 28-February 7, 1969. *T. Plowman, T. Lockwood, H. Kennedy et R. E. Schultes 2432*.

The thickened *Virola*-resin is then rolled with the fingers into tiny pellets the size of coffee beans, and these are rubbed in the salt-like residue from the leached-out lecythidaceous bark ashes. The pellets, thus coated, are ingested whole or dissolved in water and drunk. From three to six pellets—called *oo-koó-hě*—are taken initially, and the intoxication is said to begin within five minutes and last up to two hours. More pellets may be taken when the effects of the drug begin to lessen in intensity.

According to my informant's description, all kinds of visual hallucinations are experienced. The narcotic is taken usually in a group comprising from three to eight or more men, normally including the *payé* or witch-doctor. Only the *payé* may take the initiative in preparing the drug. It is taken not regularly but at irregular intervals when the need arises, and only for divination, to "see and converse with the little people", to prophecy, to find lost property, to "study", to "talk with" people from other tribes over great distances and to ensure luck in the hunt.

Dr. Horacio Calle, anthropologist at the Universidad Nacional de Colombia, has recently sent me some very interesting data and botanical specimens collected from informants of the Muinane tribe, now living in the vicinity of Leticia. These Indians lived originally in the Karaparaná-Igaraparaná-Kahuinarí area, the general region inhabited by the Witotos.

According to Calle, the Muinanes call the *Virola* tree *kutruçu* and the drug prepared from its resin *kutru*. The related Bora tribe likewise knows the narcotic which, in their language, is *kurru*.

Several very young leaves, collected by Calle, are difficult to identify as to species. According to Calle, botanists at the Instituto de Ciencias Naturales in Bogotá

*VIROLA*  
*theiodora*  
(Spr. ex Bth.)  
Warburg



tentatively referred them to one of the following species: *Virola elongata*, *V. peruviana* (A. DC.) Warburg or *V. calophylloidea*. His Indian informant stated that there are several "kinds of *ucuna*, some with leaves larger than others", but that the tree with the smallest leaves is "the true *ucuna*", i.e., meaning probably the *Virola* employed to prepare the hallucinogen. These *Virola* leaves which Calle collected are now preserved in the Economic Herbarium of Oakes Ames and appear to me possibly to represent *V. calophylloidea*.<sup>3</sup>

The data concerning the admixture which Calle reports are perhaps even more interesting. In preparing the pellets for ingestion, the Muinane informant stated that the *Virola*-bark, freshly stripped from the tree, is crushed and boiled in water, until the liquid is thick and of a honey-like consistency. This syrup is then mixed with ashes of the rind of fruit of a species of *Theobroma* or of the dried leaves of a palm, *Mauritiella aculeata* (HBK.) Burret. The mixture is then rolled into soft, brownish pellets.

It would seem, thus, that there is some variation in the methods of preparing the drug. Further field work in the original home region of these Indians will be necessary for a full understanding of this interesting hallucinogen.

Interest in this newly discovered hallucinogen does not lie wholly within the bounds of anthropology and ethnobotany. It bears very directly on certain pharmacological matters, and, when considered with other plants with psychotomimetic properties due to tryptamines, this new oral drug poses problems which must now be faced and, if possible, toxicologically explained.

It is generally accepted pharmacologically that the pure compound N, N-dimethyltryptamine is inactive

<sup>3</sup> Comisaría del Amazonas, 8 km. north of Leticia. Muinane name: *kutruku*. April 1969. H. Calle sin. num.



when administered orally, unless accompanied by a monoamine oxidase inhibitor (6). The tryptamines—especially N, N-dimethyltryptamine—are the active constituents of hallucinogenic snuffs of South America (2, 6, 13, 22, 27) prepared from *Anadenanthera peregrina* (yopo), *A. colubrina* (huilca) and *Virola theiodora* and probably other species (yakee, epená, nyakwana, paricá) (22). Yet the narcotic *vinho de yurema*, prepared from the roots of *Mimosa hostilis* (11), the active constituent of which is N, N-dimethyltryptamine, is extremely active when taken orally. It has furthermore recently been learned that the two common admixtures of the ayahuasca, caapi or yajé drink prepared basically from bark of either *Banisteriopsis Caapi* or *B. inebrians*, rich in harmala alkaloids, are leaves containing N, N-dimethyltryptamine: *Banisteriopsis Rusbyana* (1, 6, 16) and *Psychotria psychotriaefolia* (7). There is no question but that the addition of leaves of *Psychotria psychotriaefolia* and especially of *Banisteriopsis Rusbyana* very strongly enhances the color visions, increases the intoxication and prolongs the narcotic effects of the drink. In the case of these two admixtures, it is clear that, when added to a beverage containing the harmala alkaloids, harmine and harmaline, they would be in the presence of monoamine oxidase inhibitors. As has recently been suggested, “. . . perhaps this fact, coupled with the presence of small amounts of related isomers, may help account for the effectiveness of the crude preparation. . .” or “perhaps the strong concentration of active principles or the presence of other unidentified substances facilitate absorption” (6).

In the instance of yurema, which is prepared apparently from the roots of *Mimosa hostilis* with no admixture whatsoever, a monoamine oxidase inhibitor might possibly be present, but we do not yet know. With the orally administered *Virola*-resin of the Witotos, one

must assume that the tryptamine acts without such an inhibitor or else that the residue from the leaching of the lecythidaceous bark-ashes contains a monoamine oxidase inhibitor.

All of this points out with singularly insistent emphasis the wisdom of an interdisciplinary approach in the search for new psychoactive drugs, since the value of folklore data has so often in recent studies been indicated (18). It points further to the urgency of intensive ethno-toxicological study of folklore in view of the rapid disintegration and disappearance of aboriginal cultures around the world (19, 21).

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